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10/643,265	08/19/2003	Toshiki Hirano	HSJ920030072US1	4667

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EXAMINER

KLIMOWICZ, WILLIAM JOSEPH

ART UNIT PAPER NUMBER

2627

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/643,265

Applicant(s)

HIRANO ET AL.

Examiner

William J. Klimowicz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Status

Claims 1-8 are currently pending, of which, claims 1, 4, 5 and 8 are independent.

Prosecution Reopened

The prosecution has been reopened in this application, to allow the Examiner to enter recently uncovered, more pertinent art, in addition to clarifying some aspects of a prior rejection that is being maintained. A rejection of all pending claims is articulated, *infra*.

The rejection of claims 4 and 8 previously rejected under 35 U.S.C. 102(a) as being anticipated by Shimanouchi et al. (WO 02/097803 A1) has been vacated.

The rejection of claims 1, 3, 5 and 7 under 35 U.S.C. 103(a) as being unpatentable over Plotto (US 4,473,855) in view of Zhang et al. (US 6,396,667 B1) as well as the rejection of claims 2 and 6 under 35 U.S.C. 103(a) as being unpatentable over Plotto (US 4,473,855) in view of Zhang et al. (US 6,396,667 B1) as applied to claim 1 and claim 5, respectively, and further in view of Severson (US 6,549,365 B1), are all vigorously being maintained.

Additionally, claims 1-3 and 5-7 are being newly rejected under 35 U.S.C. 103(a) as being unpatentable over Hosono et al. (JP 03-069005 A) in view of Zhang et al. (US 6,396,667 B1).

Moreover still, claims 4 and 8 are being newly rejected under 35 U.S.C. 103(a) as being unpatentable over Kosikawa (JP 01-158605 A) in view of Mei et al. (US 6,611,399 B1).

Claim Objections

Claim 4 is objected to because of the following informalities:

With regard to claim 4 (line 3), the word "A" should be spelled as the word -- a --.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plotto (US 4,473,855) in view of Zhang et al. (US 6,396,667 B1).

As per claim 1 and 5, Plotto (US 4,473,855) discloses a disk drive (e.g., see COL. 1, line 16, *et seq.*) and an airflow shroud for a slider, comprising: a frame portion (PROTECT) having an opening suitable for exposing an air bearing surface of a slider (SV) for a disk drive, the frame portion (PROTECT) surrounding the slider (SV); and an attachment portion adapted for attachment to a suspension (SUSP/PLAQ) of a disk drive (e.g., see, *inter alia*, COL. 7, lines 17-21). Note that the (SUSP) and the integral portion (PLAQ) support and suspend the slider (SV) as a whole.

Per claim 1 and claim 5, however, Plotto (US 4,473,855) does not expressly disclose a moving-slider-type microactuator coupled to the slider.

Zhang et al. (US 6,396,667 B1) discloses a slider and head suspension of an analogous type disclosed by Plotto (US 4,473,855), but additionally expressly teaches providing a moving-slider-type microactuator (including 66, 64, 176) coupled to a slider (24) for the purpose of providing a small microactuator that advantageously allows high resolution head positioning (e.g., see, *inter alia*, COL. 1, line 39 *et. seq.*)

Given the express teachings and motivations, as espoused by Zhang et al. (US 6,396,667 B1), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the moving-slider-type microactuator as taught by Zhang et al. (US 6,396,667 B1), to the slider of Plotto (US 4,473,855).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the moving-slider-type microactuator as taught by Zhang et al. (US 6,396,667 B1), to the slider of Plotto (US 4,473,855) in order to provide a small microactuator that advantageously allows high resolution head positioning (e.g., see, *inter alia*, COL. 1, line 39 *et. seq.*)

Additionally, as per claims 3 and 7, Plotto (US 4,473,855), in combination with Zhang et al. (US 6,396,667 B1), however, remains silent as to the specific relationships set forth in claims 3 and 7, i.e., wherein between about 50 to 100 micrometers of the slider (SV) are exposed through the opening of the frame portion.

Given the teachings of Plotto (US 4,473,855), however, to expressly minimize turbulence effects on the transducer and its associated components, wherein only a slight portion of the air bearing slider is exposed through the opening as seen in FIG. 5b, it would have been obvious to one of ordinary skill in the art at the time of the alleged invention to provide an approximate range of the slider exposure through the opening, including the range of “about 50 to 100 micrometers of the slider” in the course of routine optimization/ experimentation and thereby obtain various standard optimized relationships including those set forth in claims 3 and 7.

That is, given the teachings of Plotto (US 4,473,855), however, to expressly minimize turbulence effects on the transducer and its associated components, wherein only a slight portion of the air bearing slider is exposed through the opening as seen in FIG. 5b, it would have been obvious to one of ordinary skill in the art at the time of the alleged invention to provide an approximate range of the slider exposure through the opening, including the range of “about 50 to 100 micrometers of the slider” in the course of routine optimization/ experimentation and thereby obtain various standard optimized relationships including those set forth in claims 3 and 7 in order to protect the majority of the slider from the impinging effects of turbulent air on the slider by providing a minimal exposure of the slider, e.g., “about 3 micrometers,” while also providing sufficient slider shroud protection while allowing enough the of the air bearing surfaces of the slider to provide the desired floating quality, e.g., an upper range of exposure at “about 50 micrometers.” Such a range of slider exposure through the frame opening of “about 50 to 100 micrometers of the slider” is considered to be within the level of ordinary skill in the art, given the teachings and suggestion of Plotto (US 4,473,855).

Additionally, the law is replete with cases in which when the mere difference between the claimed invention and the prior art is some range, variable or other dimensional limitation within the claims, patentability cannot be found.

It furthermore has been held in such a situation, the Applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Moreover, the instant disclosure does not set forth evidence ascribing unexpected results due to the claimed dimensions. See *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338 (Fed. Cir. 1984), which held that the dimensional limitations failed to point out a feature which performed and operated any differently from the prior art.

Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plotto (US 4,473,855) in view of Zhang et al. (US 6,396,667 B1) as applied to claim 1 and claim 5, respectively, above, and further in view of Severson (US 6,549,365 B1).

See the description of Plotto (US 4,473,855) and Zhang et al. (US 6,396,667 B1), *supra*.

As per claims 2 and 6, Plotto (US 4,473,855) does not expressly disclose wherein the frame portion (PROTECT) has side portions forming the opening and a tapered shape between each side portion and the opening.

Severson (US 6,549,365 B1), however, discloses an analogous frame/shroud for diverting air currents directed at the slider, wherein Severson (US 6,549,365 B1) additionally discloses

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wherein the frame portion has side portions inclusive of a tapered shape between each side portion and the opening. See embodiments of Figures 8-12 of Severson (US 6,549,365 B1).

Given the express teachings and motivations, as espoused by Severson (US 6,549,365 B1), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the frame portion of Plotto (US 4,473,855) (in combination with Zhang et al. (US 6,396,667 B1)) as having has side portions inclusive of a tapered shape between each side portion and the opening, as expressly suggested by the embodiments of FIGS. 8-12 of Severson (US 6,549,365 B1).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the frame portion of Plotto (US 4,473,855) (in combination with Zhang et al. (US 6,396,667 B1)) as having has side portions inclusive of a tapered shape between each side portion and the opening, as expressly suggested by the embodiments of FIGS. 8-12 of Severson (US 6,549,365 B1) in order to “avoid sharp compression corners and expansion corners in the flow field,” thus minimizing “boundary layer separation and flow instabilities.” See Severson (US 6,549,365 B1) at COL. 6, lines 4-8.

Claims 1-3 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosono et al. (JP 03-069005 A) in view of Zhang et al. (US 6,396,667 B1).

As per claim 1 and 5, Hosono et al. (JP 03-069005 A) discloses a disk drive (e.g., see FIGS. 2 and 3 and/or FIGS. 4 and 5) and an airflow shroud for a slider (12 or 11) (note that the shroud (31 or 11) affects transverse air from impinging upon the slider, allowing only limited airflow as opposed to the slider without the shroud covering), comprising: a frame portion (31

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or 11) having an opening suitable for exposing an air bearing surface of a slider (12) for a disk drive (e.g., see FIGS. 1 and/or 4), the frame portion (31 or 11) surrounding the slider (12); and an attachment portion (35 or 15) adapted for attachment to a suspension (13) of a disk drive (e.g., see, FIGS. 2 and 5).

Additionally, as per claims 2 and 6, wherein the frame portion (31 and/or 11) has side portions forming the opening and a tapered shape (e.g. see bevels along the front end portions of (33a and 34a) as seen in FIG. 1 between each side portion and the opening.

Per claim 1 and claim 5, however, Hosono et al. (JP 03-069005 A) does not expressly disclose a moving-slider-type microactuator coupled to the slider.

Zhang et al. (US 6,396,667 B1) discloses a slider and head suspension of an analogous type disclosed by Hosono et al. (JP 03-069005 A), but additionally expressly teaches providing a moving-slider-type microactuator (including 66, 64, 176) coupled to a slider (24) for the purpose of providing a small microactuator that advantageously allows high resolution head positioning (e.g., see, *inter alia*, COL. 1, line 39 *et. seq.*)

Given the express teachings and motivations, as espoused by Zhang et al. (US 6,396,667 B1), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the moving-slider-type microactuator as taught by Zhang et al. (US 6,396,667 B1), to the slider of Hosono et al. (JP 03-069005 A).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the moving-slider-type microactuator as taught by Zhang et al. (US 6,396,667 B1), to the slider of Hosono et al. (JP 03-069005 A) in order to provide a small microactuator that

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advantageously allows high resolution head positioning (e.g., see, *inter alia*, COL. 1, line 39 *et seq.*)

Additionally, as per claims 3 and 7, Hosono et al. (JP 03-069005 A), in combination with Zhang et al. (US 6,396,667 B1), however, remains silent as to the specific relationships set forth in claims 3 and 7, i.e., wherein between about 50 to 100 micrometers of the slider (SV) are exposed through the opening of the frame portion.

Given the teachings of Hosono et al. (JP 03-069005 A), however, to expressly minimize external magnetic fields impinging upon a flying magnetic head slider, without affecting the nominal flying slider-to-disk interactions with a rotating magnetic disk medium, wherein only a slight portion of the air bearing slider is exposed through the opening as seen in FIGS. 2, 3 and/or 5, it would have been obvious to one of ordinary skill in the art at the time of the alleged invention to provide an approximate range of the slider exposure through the opening, including the range of "about 50 to 100 micrometers of the slider" in the course of routine optimization/experimentation and thereby obtain various standard optimized relationships including those set forth in claims 3 and 7.

That is, given the teachings of Hosono et al. (JP 03-069005 A), however, to expressly minimize external magnetic fields impinging upon a flying magnetic head slider, without affecting the nominal flying slider-to-disk interactions with a rotating magnetic disk medium, wherein only a slight portion of the air bearing slider is exposed through the opening as seen in FIGS. 2, 3 and/or 5, it would have been obvious to one of ordinary skill in the art at the time of the alleged invention to provide an approximate range of the slider exposure through the

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opening, including the range of “about 50 to 100 micrometers of the slider” in the course of routine optimization/ experimentation and thereby obtain various standard optimized relationships including those set forth in claims 3 and 7 in order to protect the majority of the slider from the impinging effects of turbulent air on the slider by providing a minimal exposure of the slider, e.g., “about 3 micrometers,” while also providing sufficient slider shroud protection while allowing enough the of the air bearing surfaces of the slider to provide the desired floating quality, e.g., an upper range of exposure at “about 50 micrometers.” Such a range of slider exposure through the frame opening of “about 50 to 100 micrometers of the slider” is considered to be within the level of ordinary skill in the art, given the teachings and suggestion of Hosono et al. (JP 03-069005 A).

Additionally, the law is replete with cases in which when the mere difference between the claimed invention and the prior art is some range, variable or other dimensional limitation within the claims, patentability cannot be found.

It furthermore has been held in such a situation, the Applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Moreover, the instant disclosure does not set forth evidence ascribing unexpected results due to the claimed dimensions. See *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338 (Fed. Cir. 1984), which held that the dimensional limitations failed to point out a feature which performed and operated any differently from the prior art.

Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosikawa (JP 01-158605 A) in view of Mei et al. (US 6,611,399 B1).

As per claims 4 and 8, Kosikawa (JP 01-158605 A) discloses an airflow shroud capable of being used with a moving-head-type microactuator in a disk drive, comprising: a plate portion (e.g., rear portion of shroud (31)) attachable to a slider (31), and a recessed portion (e.g., window within shroud (31)) corresponding to a moving-head-type microactuator of the slider, when positively coupled to such slider.

As per claims 4 and 8, *assuming* that the limitations of claims 4 and 8 *positively* require the moving-head-type microactuator on the slider (11), Mei et al. (US 6,611,399 B1) discloses such a conventional moving-head-type microactuator.

Given the express teachings and motivations, as espoused by Mei et al. (US 6,611,399 B1), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the moving-head-type microactuator as taught by Mei et al. (US 6,611,399 B1), with the shroud covering of Kosikawa (JP 01-158605 A).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the moving-head-type microactuator as taught by Mei et al. (US 6,611,399 B1), with the shroud covering of Kosikawa (JP 01-158605 A), in order to allow fine-tuned vertical and lateral head displacement at the slider level, as advantageously disclosed by Mei et al. (US 6,611,399 B1), while simultaneously obstructing the convergence of leakage flux from outside of a magnetic pole associated with the slider, as espoused by Kosikawa (JP 01-158605 A).

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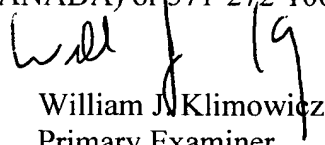
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Klimowicz whose telephone number is (571) 272-7577. The examiner can normally be reached on Monday-Thursday (6:30AM-5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


William J. Klimowicz
Primary Examiner
Art Unit 2627

WJK